

Appl. No.: 10/075,726

Group Art Unit: 1743

Applicants' Response to the Office Action dated September 14, 2004

REMARKS

Claims 1-20 are currently pending in the present application.

In the Office Action, the Examiner rejects claims 1-6, 8 and 10-20 under 35 U.S.C. §102(e), as being anticipated by U.S. Patent Application Publication No. 20020014106A1 of Srinivasan, *et al.* (hereinafter referred to as "Srinivasan"). The Examiner contends that Srinivasan discloses a microfabricated microdetection array made of a glass/silicon composition, the array having a plurality of reaction spaces. The Examiner further contends that paragraph [0046] of Srinivasan discloses the use of a silicon dioxide coating having a thickness "indistinguishable from the claimed range." (*See*, the Office Action, p. 3).

On these bases, the Examiner argues that the claims are anticipated. Applicants respectfully disagree and traverse the Examiner's rejection and the arguments and contentions set forth in support thereof.

To begin with, Applicants' claimed invention is directed to chip reactors comprising a carrier *having at least two different microreaction channels*, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independent of the other.

As set forth in the Specification, Applicants' invention "combines a number of possible forms of microreactor in one miniaturized structural component . . . [i]t is possible in this way to vary a number of process parameters" using a single chip reactor. (*See*, Applicants' Specification, p. 2, ¶ [0006]).

Thus, as set forth in the Specification,

"the new chip reactor makes it possible - by problem-free actuation of the individual microreaction spaces - to test a number of possible forms of microreaction systems for their suitability for liquid-phase reactions and optimization of the test results so that a number of experiments can be carried out far more quickly and with less outlay." (*See, id.* at ¶ [0007]).

In other words, Applicants' invention is directed to chip reactors having at least two microreaction channels that are not identical. For example, in one preferred embodiment of

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Applicants' invention, as shown in Figure 1, a chip reactor has 19 **different** microreaction channels.

In contrast, Srinivasan is directed to a gas chromatograph which has four or more analysis channels, one for each of the four or more gas chromatography columns described therein. (*See, e.g.*, ¶ [0008]). However, it is clear from the disclosure of Srinivasan that each of the microdetectors, or thermal conductivity sensors, is identical to the others. Thus, while the microdetectors are described as having an inlet for the gas sample, an outlet for the gas sample, and a detection cavity -- each inlet/cavity/outlet is the same.

Thus, Srinivasan fails to teach each and every element of the claimed invention, most notably, a chip reactor comprising a carrier having at least two different microreaction channels. Accordingly, Srinivasan fails to anticipate the claimed invention. Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. §102(e).

In the Office Action, the Examiner rejects claims 7 and 9 under 35 U.S.C. §103(a), as being unpatentable over Srinivasan. Specifically, the Examiner contends that while Srinivasan is silent as to the length of a reaction channel and the mixing angle, that such elements are simply the routine optimization of result-effective variables. On that basis, the Examiner argues that the claims are obvious. Applicants respectfully disagree and traverse the rejection and the arguments and contentions in support thereof.

As mentioned above, Applicants' claimed invention is directed to chip reactors comprising a carrier *having at least two different microreaction channels*, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independent of the other.

It is well-settled that in order to establish a *prima facie* case of obviousness based upon a single reference, and thus shift the burden of proving non-obviousness onto Applicants, the Examiner MUST satisfy each of the following three criteria: (1) the reference must contain a teaching or suggestion which would motivate one of ordinary skill in the art to modify the reference as suggested by the Examiner (it is not sufficient to say that the reference can be

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modified without a teaching in the cited reference to suggest the desirability of such a modification); (2) there must be a reasonable expectation of success; and (3) the reference must teach or suggest each and every element of Applicant's claimed invention. The teaching or suggestion to modify the cited art and the reasonable expectation of success must both be found in the prior art and not in Applicants' Specification. (M.P.E.P. §2143).

Srinivasan fails to teach or suggest a chip reactor comprising a carrier having at least two *different* microreaction channels. Srinivasan is directed to a gas chromatograph with multiple *identical* microdetection devices. Each column of the chromatograph and the associated detection equipment is identical. Moreover, there is no teaching or suggestion in Srinivasan which would motivate one of ordinary skill in the art to modify its teachings to arrive at Applicants' claimed invention.

Accordingly, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness based upon Srinivasan. Reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) are respectfully requested.

Finally, in the Office Action, the Examiner provisionally rejects claims 1-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of copending U.S. patent application serial no. 10/076,736 ("the copending application"). The Examiner argues that while the claims are not identical, they are not patentably distinct from each other because both sets of claims are directed to microreactors of identical composition. Applicants respectfully traverse this rejection and the arguments and contentions set forth in support thereof.

The claims of the copending application are directed to microreactors comprising at least one microreaction system contained on a carrier material, the microreaction system comprising: (a) at least one microreaction space; (b) at least one inlet for receiving educts into the microreaction space; (c) at least one outlet for discharging reaction products from the microreaction space; and (d) an inert coating material covering a reaction surface of the microreaction system.

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However, the claims of the instant application are directed to chip reactors comprising a carrier *having at least two different microreaction channels*, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independent of the other.

Accordingly, Applicants submit that the instant claims are not obvious in view of the claims of the copending application, and respectfully request reconsideration by the Examiner and withdrawal of the rejection under the judicially created doctrine of obviousness-type double patenting.

In view of the remarks set forth above, Applicants submit that all pending claims patentably distinguish over the prior art of record and known to Applicants, either alone or in combination. Accordingly, reconsideration, withdrawal of the rejections and a Notice of Allowance are respectfully requested.

Respectfully submitted,

TORSTEN ZECH, et al.

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By: 

AARON R. ETTELMAN

Registration No. 42,516

COGNIS CORPORATION

300 Brookside Avenue

Ambler, PA 19002

Telephone: (215) 628-1413

Facsimile: (215) 628-1345

E-Mail: AARON.ETTELMAN@COGNIS.COM

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